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Appraisal

Critically Appraised Papers

Gait improves after 12 weeks of intensive resistance and functional training in people with mild to moderate dementia

Synopsis

Summary of: Schwenk M, Zieschang T, Englert S, Grewal G, Najafi B, Hauer K. Improvements in gait characteristics after intensive resistance and functional training in people with dementia: a randomised controlled trial. *BMC Geriatrics* 2014; 14:73.

Question: Does an intensive progressive resistance and functional exercise program improve gait characteristics in people with dementia? ***Design***: Randomised, controlled trial with concealed allocation and blinding of participants and assessors. ***Setting***: A geriatric hospital and outpatient nursing care service in Germany. ***Participants***: Inclusion criteria were: adults aged at least 65 years with a confirmed dementia diagnosis, cognitive impairment (Mini-Mental State Examination score 17 to 26), and able to walk 10 m or more without a walking aid. A key exclusion criterion was living more than 15 km from the study centre. Randomisation allocated 26 people to the exercise intervention and 35 people to the control group. ***Interventions***: The exercise group participated in two 2-hour sessions each week for 12 weeks. A qualified instructor supervised the exercise sessions, which comprised resistance and functional training. Resistance training targeted functionally relevant muscle groups at an intensity of 70 to 80% of one repetition maximum. Functional training focused on tasks like sit to stand and walking, with progression by altering speed, amplitude or accuracy of performance. The control group met twice per week for 1 hour of low-intensity supervised training; they performed activities that were not expected to affect walking, such as flexibility exercises and ball games while seated. ***Outcome measures***: The primary outcome was gait performance (speed, cadence, stride length, double support time, step width and step time variability), measured using an electronic gait analysis system (GAITRite) at baseline and 12 weeks. ***Results***: Forty-nine participants (80%), with a mean age of 82 years (SD 8) and a Mini-Mental State Examination average of 21 points (SD 3), completed the study. There was greater than 90% adherence to the program in both groups. Results significantly favoured the high-intensity exercise group at 12 weeks, with differences of: 18 cm/second for gait speed (95% CI 10 to 27); 11 steps/minute for cadence (95% CI 4 to 18); 8 cm for stride length (95% CI 2 to 14); –0.08 seconds for stride time (95% CI –0.12 to –0.03); and –2.9% for double support as a percentage of stride time (95% CI –4.5 to –1.3). There were no significant differences between the groups for step width and step time variability. A lower functional performance at baseline, but not cognitive status, was independently associated with improvements in gait speed. ***Conclusion***: A 12-week high-intensity resistance and functional exercise program improved temporal and spatial characteristics of gait for older people with mild to moderate dementia.

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Commentary

Gait problems that are associated with dementia include slowing and increased step-to-step variability, and are present from the earliest disease stages. They are related to decreased executive function, are risk factors for falling[1] and diminish functional independence.[2] Given the rapidly increasing prevalence of dementia, there is substantial value in developing methods of improving or maintaining gait function in this population. The study by Schwenk and colleagues is important, in that it is a well-designed trial that provides strong evidence of the effectiveness of a training program to improve walking in older people with dementia. The high adherence rates and lack of serious adverse events in a relatively frail group increase the clinical applicability of the training program.

A key aspect for translation into clinical practice is the combination of resistance training and practice of functional activities, which supports previous findings that multi-component interventions may be more effective than single-component interventions.[3,4] Other important program elements are the progressive modification of training activities according to individual performance and the systematic use of strategies tailored for people with cognitive impairment to facilitate adherence.

An issue for clinicians may be the need for early intervention. The study group included people with mild to moderate dementia. Unfortunately, there are a number of potential barriers to early referral for gait rehabilitation for people with dementia. These include referral to rehabilitation occurring only after multiple falls and referrers being unaware of effective gait rehabilitation programs. While the study findings may not generalise to those with more severe dementia, it is worth noting that the greatest benefit of the training was in participants with the greatest functional impairment. It should also be noted that despite the clinically meaningful improvement in velocity, there was a lack of improvement in gait variability, which is a risk factor for falling. This will need to be addressed in future research.

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References

1. Nakamura T, et al. *Gerontology.* 1996;42:108–113.
2. Hebert LE, et al. *Am J Alzheimers Dis Other Demen.* 2010;25:425–431.
3. Blankevoort CG, et al. *Dement Geriatr Cogn Disord.* 2010;30:392–402.
4. Potter R, et al. *Int J Geriatr Psychiatry.* 2011;26:1000–1011.

http://dx.doi.org/10.1016/j.jphys.2015.02.010